REMARKS

This Amendment is filed in response to the Office Action mailed April 14, 2008. The Applicant respectfully requests reconsideration of the rejections in light of the below discussion. All rejections are respectfully traversed.

Claims 1-35 and 41-48 are now pending in the case.

Claims 20 and 36 are amended.

No new claims have been added.

Request for Interview

The Applicant respectfully requests a telephonic interview to advance the prosecution of this case. The Applicant believes an interview will be most productive after the Examiner has had an opportunity to review this Amendment, but prior to the issue of the next Office Action. As the Applicant can not determine when the Examiner will have time to consider this Amendment, given PTO workload, the Applicant respectfully requests the Examiner contact the Applicant at 617-951-2500 when he reviews this Amendment so that a time convenient to the Examiner may be arranged for a telephonic interview.

Claim Rejections – 35 U.S.C. §103

At paragraphs 2-4 of the Final Office Action, claims 1, 2, 4, 6, 7, 9, 11, 13, 17 and 19 and 41-44 were rejected under 35 U.S.C. §103(a) over Azuma et al., U.S. Patent No. 6,430,150 (hereinafter "Azuma") in view of Nishimura et al., U.S. Patent No. 5,235,599 (hereinafter "Nishimura").

The Applicant's claim 1, representative in part of the other rejected claims, sets forth:

> 1. A method for operating a node in a computer network, the node connected to other nodes by links, comprising:

determining a path to a destination, the path including one or more links;

determining at least one alternate path having at least some of its one or more links differing from the links of the path;

reserving bandwidth for said at least one alternate path;

subsequent to reserving bandwidth, detecting a link failure on the path; and

rerouting traffic on said at least one alternate path in case of a link failure.

Azuma discloses a technique for restoring service across a network when a link or node fails. "In the event of a failure in the link or the node, the node adjacent to the location of the failure broadcasts a message to the other nodes in the network to indicate where the failure has occurred. Using the received message, each node performs the computation for finding alternate paths so as to restore the telecommunication path for itself." *See* col. 4, line 67 to col. 4, lines 6 and col. 2 lines 3-21. After a link failure and computation of an alternate path, a "cross-connection phase" is initiated where resources are reserved along the alternate path, and service switched to it. *See* col. 4, line 62 to col. 5, line 8.

Nishimura discloses a "self-healing communication network." *See* col. 1, lines 8-10. The communication network consists of nodes (Fig. 1, 1-5) coupled by transmission lines (10-17) that each include one or more channels (18 and 19). *See* col. 7, lines 20-25. Some channels are being used (e.g., 18) and the others are idle and considered spare (e.g. , 19). *See* col. 7, lines 23-25. When a failure of a transmission line occurs, a node to one side of the failure is considered a "sender" and a node to the other side is considered a "chooser." *See* col. 8, lines 1-2 and col. 2, lines 27-34. The sender node "in response to a line fault, broadcasts as many route-finding packets, called CONTROL packets, to each of all adjacent nodes as there are failed regular channels." *See* col. 2, lines 34-38 and col. 8, lines 3-5. The CONTROL packets are passed along the network towards the chooser node. *See* col. 8, lines 3-5. "On receiving such CONTROL packets, the chooser sends RETURN packets back" and then changes "the status of a spare channel to 'reserved' to

reserve it as a candidate for a possible alternate route." *See* col. 8, lines 6-12 and col. 2, lines 49-54. That is, "the status of spare channels of active lines is updated from 'spare' to 'reserved' when transmitting or receiving a RETURN packet." *See* col. 8, lines 51-54. Finally, in response to the RETURN packet "the sender switches a failed channel to the spare channel specified..." to use the reserved channel.

Therefore, stated succinctly, Nishimura detects a failure, then exchanges CONTROL and RETURN packets to find alternate routes, then, for a found route, changes a status from "spare" to "reserved", and finally switches the failed channel to this new route.

The Applicant respectfully urges that neither Azuma, nor Nishimura, teach or suggest the Applicant's claimed "***reserving bandwidth for said at least one alternate path***" and "***subsequent to reserving bandwidth, detecting a link failure on the path.***"

Unlike conventional techniques, the Applicant reserves bandwidth for at least one alternate path **prior to** detecting a failure along the primary path. In this manner, the alternate path is largely already "set up" and can be activated very rapidly. The Applicant respectfully directs the Examiner's attention to Fig. 13, which details an initial allocation process for alternate paths. In particular, box 1307 indicates bandwidth is reserved, by reducing available bandwidth on an alternate path, during the initial allocation, **before a failure is even detected**.

There appears to be agreement that Azuma does not disclose this aspect of the Applicant's claims. *See* Office Action page 6 (stating "Azuma fails to clearly mention the method of *subsequent to reserving resources, detecting a link failure on the path*"). Indeed, Azuma does not even find alternate paths until after a failure is detected. *See* Azuma col. 4, line 67 to col. 4, lines 6 and col. 2 lines 3-21.

The Office Action then turns to Nishimura. However, Nishimura suffers the very same deficiency as Azuma, and, if anything, teaches away from what is claimed. Specifically, Nishimura finds alternate routes, and reserves resources on them, **only after** a failure of a link is detected. **Nishimura does not reserve any resources prior to detect-**

ing a failure of a link. Nishimura makes this clear in his specification. For example, at col. 2, lines 34-38 Nishimura states that a sender node "in response to a line fault, broadcasts as many route-finding packets, called CONTROL packets, to each of all adjacent nodes as there are failed regular channels." See col. 2, lines 34-38 and col. 8, lines 3-5. Then, "[o]n receiving such CONTROL packets, the chooser sends RETURN packets back" and then changes "the status of a spare channel to 'reserved' to reserve it as a candidate for a possible alternate route." *See* col. 8, lines 6-12 and col. 2, lines 49-54. Thus, when Nishimura's sequence of events is traced through, it is clear Nishimura first detects a failure, and only after that finds his alternate routes and changes these routes to a "reserved" status.

In the Office Action, the Examiner cites to col. 20, line 53 to col. 21, line 24 of Nishimura stating "bandwidth on each link is known before the failure occurs." The Applicant respectfully requests reconsideration. Col. 20, line 53 to col. 21, lines 11 merely describe a hypothetical network configuration that Nishimura uses to explain his techniques. Specifically, Nishimura states "[c]onsider a network…" and then describes characteristics of the hypothetical network, for example stating:

> The network has the following spare bandwidths available between nodes:
> 19.2 kbps for line 301 between nodes 6 and 1:
> 38.4 kbps for line 302 between nodes 6 and 4:
> 9.6 kbps for line 303 between nodes 4 and 1:
> 14.4 kbps for line 304 between nodes 4 and 3:
> 64.0 kbps for line 305 between nodes 1 and 3:
> 19.2 kbps for line 306 between nodes 4 and 5:
> 19.2 kbps for line 307 between nodes 3 and 2:
> 48.0 kbps for line 308 between nodes 3 and 5:
> 19.2 kbps for line 309 between nodes 5 and 2:

See col. 20, lines 53 and col. 20, line 63 to col. 21, line 5. Nishimura then states "[a]ssume a line fault occurs in the transmission line between nodes 1 and 2…," thus setting the stage for his hypothetical example. *See* col. 20, lines 6-7. With the hypothetical example in place, Nishimura goes on to describe an exchange of packets that occurs in response to detecting the line failure. *See* col. 21, lines 12-24.

Nothing in this description suggests any spare bandwidth is ***reserved*** before a failure is detect. Nishimura simply states that spare bandwidth **exists** in the network. As discussed above, Nishimura explicitly describes elsewhere in his specification that this existing spare bandwidth is reserved only after a failure is detected.

Accordingly, the Applicant respectfully urges that the combination of Azuma and Nishimura is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) because of the absence of, and teachings away from, the Applicant's claimed novel "***reserving bandwidth for said at least one alternate path***" *and* "***subsequent to reserving bandwidth, detecting a link failure on the path.***"

At paragraphs 4-5 of the Office Action, claims 3, 5, 8, 10, 12, 14-16, 18, and 20-35 were rejected under 35 U.S.C. §103(a) over Azuma in view of Katzela et al., U.S. Patent No. 5,872,773 (hereinafter Katzela) in further view of Nishimura.

Claims 3, 5, 8, 10, 12, 14, 18, and 20 are dependent claims that dependent from independent claims believed to be allowable for the reasons discussed above. Accordingly, claims 3, 5, 8, 10, 12, 14, 18 are believed to be allowable due to their dependency, as well as for other separate reasons.

The Applicant's claim 21, representative in part of claims 15-16 and 21-35, sets forth:

> 21. A method of non-disruptive packet switching in a network having nodes interconnected with transmission trunks, said method comprising:
>
> pre-selecting at least on alternate path for each trunk;
>
> reserving connections at each node to make said at least one alternate path;
>
> ***reserving bandwidth resources to transmit packets on said at least one alternate path;***
>
> ***subsequent to steps of sending and reserving, detecting a failure of a particular trunk***;

switching the path of a packet from said particular trunk, in response to failure of said particular trunk, to said at least one alternate path; and

re-selecting at least one new alternate path for each trunk in response to user traffic, network resources, and quality of service changes.

Katzela simply discloses a wireless communications network where cells are routed according to virtual path identifiers (VPIs). *See* abstract.

The Applicant respectfully urges that the combination of Azuma, Katzela and Nishimura does not teach or suggest the Applicant's claimed "***reserving bandwidth resources to transmit packets on said at least one alternate path***" and "***subsequent to the reserving connections and reserving resources, detecting a failure of a particular trunk.***"

As discussed above, neither Azuma, nor Nishimura reserve bandwidth resources for an alternate path **prior to** detecting a failure on the primary path. Katzela in no way remedies the deficiencies of Azuma and Nishimura, being silent on the topic.

Accordingly, the Applicant respectfully urges that the combination of Azuma, Katzela and Nishimura is legally insufficient to make obvious the present claims under 35 U.S.C. §103 because of the absence of the Applicant's claimed novel "***reserving bandwidth resources to transmit packets on said at least one alternate path***" and "***subsequent to the reserving connections and reserving resources, detecting a failure of a particular trunk***."

Claim Rejections – 35 U.S.C. §102

At paragraph 1 of the Office Action, claims 45 and 46 where rejected under 35 U.S.C. §102(b) over Nishimura.

Applicant's claim 45, representative also of claim 46, sets forth (emphasis added):

45. A method comprising:

determining a path to a destination, the path including one or more links;

determining at least one alternate path having at least some of its one or more links differing from the links of the path;

sending one or more set-up request messages along the at least one alternate path to ***request one or more nodes along the path reserve resources for, and enable, the at least one alternate path;***

reserving resources for, but not enabling, the at least one alternate path at a head node of the at least one alternate path;

subsequent to steps of sending and reserving, detecting a link failure on the path; and

rerouting traffic on the at least one alternate path in case of a link failure by enabling the at least one alternate path in the head node, absent sending additional set-up messages to one or more nodes along the at least one alternate path.

First, the Applicant respectfully urges that Nishimura teaches away from "***subsequent to steps of sending and reserving, detecting a link failure on the path.***"

As discussed in detail above, Nishimura finds his alternate routes, and reserves them, **only after** a failure of a link is detected. Accordingly, claim 45 is believed to be patentable over Nishimura for at least this reason.

Second, the Applicant respectfully urges that Nishimura is silent regarding the claimed "***request one or more nodes along the path reserve resources for, and enable, the at least one alternate path***" and "***reserving resources for, but not enabling, the at least one alternate path at a head node of the at least one alternate path***" and "***rerouting traffic on the at least one alternate path in case of a link failure by enabling the at least one alternate path in the head node, absent sending additional set-up messages to one or more nodes along the at least one alternate path.***"

The Applicant novelly prepares an alternate path by enabling the alternate path in nodes along the alternate path, while not enabling the alternate path in a head node of the path. In this manner, the alternate path is "set up" in the network (with the exception of the head node) in advance. After a failure is detected, to switch traffic to the alternate path the head node merely needs to enable the path, typically a very rapid operation. The other downstream nodes need not be coordinated with at that time. That is, additional set-

up messages are not sent to the nodes along the alternate path, advantageously avoiding what is typically a very slow operation.

Nishimura does not teach one should "***request one or more nodes along the path reserve resources for, and enable, the at least one alternate path…but not enabling, the at least one alternate path at a head node of the at least one alternate path***" and then "***rerouting traffic on the at least one alternate path … by enabling the at least one alternate path in the head node, absent sending additional set-up messages to one or more nodes along the at least one alternate path.***" In sharp contrast, Nishimura teaches rerouting of traffic requires a lengthy exchange of set up messages with nodes along the alternate route, first to find the alternate path, and later to reserve resources along the alternate path. Specifically, Nishimura describes that a sender node "in response to a line fault, broadcasts as many route-finding packets, called CONTROL packets, to each of all adjacent nodes as there are failed regular channels. See col. 2, lines 34-38 and col. 8, lines 3-5 and col. 2. The CONTROL packets are passed along the network towards the chooser node. *See* col. 8, lines 3-5. "On receiving such CONTROL packets, the chooser sends RETURN packets back" and then changes "the status of a spare channel to 'reserved' to reserve it as a candidate for a possible alternate route." *See* col. 8, lines 6-12 and col. 2, lines 49-54. Finally, in response to the RETURN packet the sender switches a failed channel to the spare channel specified. Such a lengthy exchange certainly does not teach "***rerouting traffic on the at least one alternate path…absent sending additional set-up messages to one or more nodes along the at least one alternate path.***"

Accordingly, the Applicant respectfully requests reconsideration of the rejection of claims 45 and 46 under 35 U.S.C. §102.

The Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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